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THE MODERN ARMY IN WAR — PAGE EIGHT

Vol. 12 MARCH, 1960 No. 8

CHICAGO

This great city has been called the
World's butcher of hogs and its
Maker of tools. It has been called a
Cereal and railroad center, and a
Center for the handling of freight.
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COVER STORY

Herbert Payne Sedwick, recipient of the Washington Award for 1960, appears on our cover. The Award was conferred upon Mr. Sedwick "for leadership and achievement in electric and gas utilities, for true service in educational and humanitarian fields, for developing young engineers."

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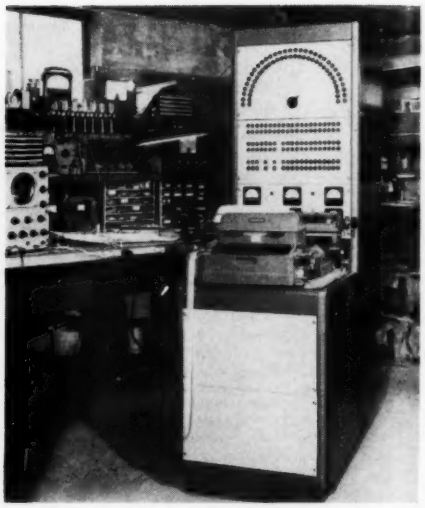
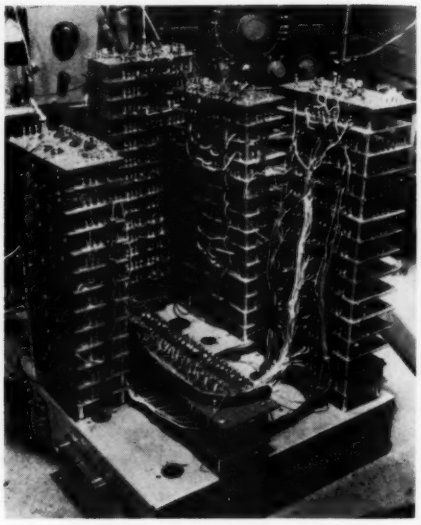
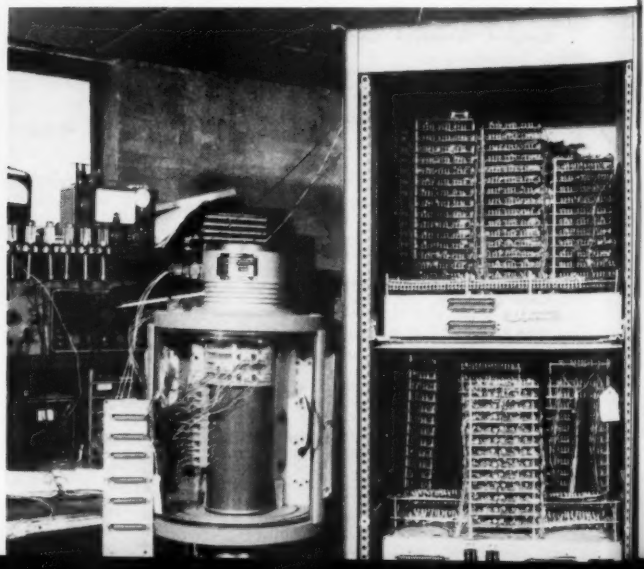
January 19 at WSE





At top, left, is a general view of the Western Society Dining Room as members and guests enjoyed their dessert. Above, left, are seen two of the evening's speakers: John S. Carter, at left in the picture, and David M. Boyd, Jr. Below, left, A. B. Discus, R. L. Wall, and Paul Van T. Heddin converse.

David M. Boyd, Jr., the Dinner Speaker, told of the computer project that is being carried on by students of Hinsdale, Illinois, High School under his supervision. The computer is shown here in the pictures.



THE WESTERN SOCIETY'S FIRST GENERAL MEETING OF 1960

DINNER MEETING

The Western Society's January General Meeting was held on the 19th, at the Society's Headquarters in Chicago.

The Dinner Speaker was Mr. David M. Boyd, Jr., electronics expert with the Universal Oil Products Company, who spoke on the "Hinsdale High School Computer Project." Mr. Boyd is supervising this group of young scientists which started out, rather spontaneously, building an electronic computer. At first, the high school students constructed the parts for the computer by themselves. Existence of the project became more generally known among firms and others interested in computer technology, and many component parts for constructing a more sophisticated computer were given for use in the project.

A list of parts donated would include a Flexowriter, magnetic drum with 50 heads, silicon diodes and transistors.

The computer's increasing vocabulary has now grown to over 8,000 words.

Mr. Boyd's great interest and enthusiastic supervision of the project were easily sensed among the Western Society audience, and many expressions of approval were voiced.

Sons of at least two Society members attended to hear this talk.

TECHNICAL SESSION 1

Mr. John S. Carter of the American Bridge Division of United States Steel presented a film entitled "The Challenge at Carquinez." This was one of the two simultaneous technical sessions held at the conclusion of the Dinner Meeting. The Carquinez Bridge spans the straits between Crockett and Vallejo, California, and is an integral part of the San Francisco area bridge development program. Of special interest was the shop welding of the U. S. S. "T-1" steel.

The Carquinez Bridge project was one of the first using field fasteners in the form of high-strength bolts.

This session, sponsored by the Bridge and Structural Engineer Section, under the chairmanship of Mr. Richard N. Bergstrom, Associate, Sargent & Lundy, was terminated with a question-answer period.

TECHNICAL SESSION 2

The second of the simultaneous technical sessions was entitled "Eye in the Sky." Mr. A. B. Discus and Mr. R. L. Wall, both of the Chicago Aerial Survey, Division of Chicago Aerial Industries, gave a presentation on the contribution of photogrammetry to city planning and traffic engineering.

This technical session was sponsored by the Traffic Engineering and City Planning Section under the chairmanship of Mr. Paul Van T. Heddin.

"Data Link" Helps Study Atlas

A "data link" between an analog and a digital computer is helping in the study of simulated flight performance of the Atlas Intercontinental Ballistic Missile, the nation's electrical engineers were told in New York on Feb. 2.

The device links computers at the Astronautics Division of Convair, J. Greenstein, a Convair engineer, reported in a paper presented at a computing devices symposium during the Winter General Meeting of the American Institute of Electrical Engineers in the Hotel Statler-Hilton. Purpose of the link is to solve problems by both digital and analog means, the former having the advantage of great accuracy, and the latter the advantage of simulating equipment under study, he said in the paper titled A Two-Channel Data Link for Combined Analog-Digital Simulation.

In order to interconnect its 550 operational analog computer with its Sperry-Rand ERA 1103 digital computer, Convair in 1957 installed a special high speed data link, ordered from Epsco Inc., of Boston. "The data link, called the 'Addaverter' system . . . contains 15 analog to digital converters, 10 digital to analog converters, and gating and channel selection circuits to transfer binary data between the digital computer and the converters . . ." Mr. Greenstein said that he believes that "simplified data link, such as was built at Convair, can also meet the needs of many other computer laboratories." He said the cost is very low, compared with the cost of computers, and it can greatly extend the application of each computer.

Procedure Tests Nerve Gas Shells

A procedure for testing nerve gas shells for leaks that might prove fatal was described in St. Paul, Minn. on Sept. 28 at a chemical warfare symposium during the 41st National Meeting of the American Institute of Chemical Engineers (A.I.Ch.E.)

The gases are "percutaneously toxic in micro quantities and a concentration of a fraction of a microgram per liter may be lethal by inhalation within a relatively short time, Carl A. Martin, U.S. Army Chemical Corps, Engineering Command, reported in a paper, Design Characteristics of Equipment for Helium Leak Testing Toxic Munitions.

"The development of so called nerve gases and their use in munitions has created some difficult problems on production and handling," he observed. "These agents cannot be detected by the human senses in sublethal concentrations, and because of their low vapor pressures it is not practicable under production conditions to detect agent leaks directly unless they are of considerable magnitude . . . It has been found that leaks smaller than those capable of passing one-millionth of a cubic centimeter of helium per second or more at a pressure differential of one atmosphere do not pass significant quantities of agent. Actually vapor leakage through small orifices does not appear to be a problem, but even a very small leak may pass hazardous amounts of liquid agent."

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FUTURE ENGINEERS OF AMERICA

Future Engineers of America is an organization which started out to furnish an incentive to the high school student who has natural talent along mathematical lines.

This has been done by holding local tournaments in high schools followed by a grand tournament which was held at the Hilton Hotel in Chicago, on November 27, the day after Thanksgiving.

On September 4 an invitation was issued through high school principals to students to participate in local high school tournaments. This covered 6800 schools—the majority being in the Midwest. Entry fee was $2.00 to cover home study work kit, test materials, and prizes. 5500 students from 620 high schools responded, and went through the local test which was held on November 2. One of the rules was that students were not to solicit or accept assistance from teachers, although mutual study and help on problems in the work kit was encouraged. Small prizes were awarded the local winners, and a nominal fee was provided for the high school teacher who acted as proctor.

Following this an invitation to a grand tournament was issued for November 27, in Chicago. This was attended by about 550 students who paid their own travel and living expenses and an entry fee of $3.00. Students came from as far away as Connecticut, Texas, and Washington, including altogether 25 states. In spite of the cost and time problems 60 per cent of the students were from outside of Illinois. Of the 550 entries 123 were girls and 132 were under 15 years old. Of these under 15 years there were 15 students who correctly answered four questions involving calculus.

Preliminary Scoring

Preliminary scoring was done while tests were in progress, so that the top 10 per cent in the tests were announced before the day ended. It started with registration at 9:00 a.m., and finished with announcement of winners at 7:00 p.m.

Scores and correction for age level were checked and invitations sent to the winners for presentation of prizes at the Hilton Hotel on December 19. This was attended by about 50 students and a number of parents and teachers, some coming from as far as Cincinnati and Cleveland. Prizes were a $250.00 scholarship nest egg given by International Business Machines Co. to the winner of two tests, and 13 other cash prizes of $50.00 for first in a contest, $35.00 for second, and $25.00 for third, plus about 60 slide rules worth up to $30.00 each to individuals and eight giant slide rules to the schools of the top contenders in the team slide rule contest.

Participation certificates were given to all who took part, and special placement certificates to those who placed in the top 10 per cent.

In addition, six organizations have expressed interest or offered a summer job to high ranking contestants. These include Swift and Co., Eugene Dietzgen Co., Armour Co., International Business Machines, International Harvester, and Universal Oil Products Company.

The major winner was an 11 year old boy from Ogden Grammar School in Chicago, who received a $250.00 scholarship nest egg from I.B.M. for winning two contests on an age corrected basis.

Students, teachers and parents present voiced much enthusiasm over the program, and the opportunity it offered for competition in brains on a parallel with intersectional athletic contests. In response to questions proposed at the end of the grand tournament, a great show of hands indicated a desire to participate again. Only five indicated they wouldn't.

The success of the past tournament would seem to refute the questions raised by a prominent educator "Why would kids be crazy enough to come a long distance to win such small prizes?"

Deductions to be Drawn

It seems the principal deductions to be drawn from the recent local and grand tournaments are:

1. Gifted students are as interested in competing in a brain contest as the muscularly endowed in basketball or football.
2. High school teachers are willing to cooperate enthusiastically in a brain contest program which will interest their students.
3. Parents are enthusiastic in backing their children with traveling expenses to compete and obtain recognition which should weigh heavily toward college acceptance.
4. The high ranking students in such a program have demonstrated not only brain power of top quality, but the willingness to exercise it over and above basic school requirements. It would appear that distribution of industrial scholarships among such students would be highly rewarding to the student, to this country, and to the company.

A further program is underway for this spring using a new work kit, to hold local tournaments on March 20, 1960, followed by a grand tournament in Chicago on April 16, 1960.

Western Society Member Leo Dolkar is secretary and treasurer of Future Engineers of America, and WSE Member Donald J. Bergman also is on the Board of Directors of the group.

THE MODERN IN WAR

THIS ADDRESS WAS PRESENTED BY GENERAL ARNOLD BEFORE THE NOON LUNCHEON MEETING OF THE WESTERN SOCIETY OF ENGINEERS ON WEDNESDAY, JANUARY 6, 1960. THE LUNCHEON MEETING WAS HELD AT THE SOCIETY'S HEADQUARTERS AT 84 EAST RANDOLPH STREET IN CHICAGO.

I feel greatly honored to be here with a representative group of midwest Engineers to discuss the challenges now confronting our nation. I have great reverence for our own Army engineers who have done so much in peace and in war.

Your invitation, as we embark on a new decade of international tensions, reflects your awareness of civilian-military interdependence in national defense, and of the need to apply the best minds in every walk of American life toward the attainment of a sound defense.

Our destiny in the year just begun will be shaped by the influences, we, jointly, military and civilian, bring to bear, not only by a show of depth in our determination to survive in peace and freedom, but—equally—by the extent of our willingness to subscribe our resources and our wealth toward that objective.

The pattern of future events must necessarily be influenced by patterns of the past, and, in retrospect, one can recall shadows then portending the future. In 1936, I returned to this country from duty in China. At that time, Hitler was entrenched as chancellor in Nazi Germany, noisily rattling his Third Reich and reoccupying the Rhineland.

A war of aggression was ending in Ethiopia, and a Civil War was beginning in Spain.

Militarily we were considerably behind the times. Our armaments and tactics were largely hand-me-downs from World War I.

I recall an exercise in which we were engaged, during that period, when the 11th Infantry had to counter with wooden-wheeled 37mm guns the mechanized brigade from Fort Knox against which it was pitted. Our guns, incidentally, were mounted at the rear of a four-wheel truck, and, our opposing force was the *only* mechanized unit in our army. It consisted of an obsolete collection of miscellaneous armored vehicles of many different types.

How frustrating it was then, for a soldier, and, how incredible it must now appear, to you, when we consider that, by measure of time, we were only several months behind Czechoslovakia and the invasion of Poland.

The tragedy of that earlier day, understandably enough, was in the collective state of mind of our people.

The nation was wearily recovering from the trials of the great depression, and people were fair game of the tactics of the questionable, so-called, pressure groups, then rampant, and masquerading behind the flag and, in some instances, religion, to give weight and

ARMY

By Lt. General
William H. Arnold

credence to their siren songs of peace, through isolationism and neutrality, and to their hate slogans of "America for the Americans."

As history so well recounts, it is only when we have become frightened or enraged, as we were, for example, *after* the attack on Pearl Harbor, that we shed our personal and more selfish considerations to unite our individual capacities for a facing up to the facts of our collective salvation and survival.

So it was in the late 30's, when we moved slowly and reluctantly toward a goal of partial mobilization, on the basis of the limited emergency declared by the Chief Executive.

The climate over Europe and Asia was already heated with belligerency when, by a slim margin of one vote we finally, on the eve of Pearl Harbor, legislated into existence the first peacetime draft in our history, late in 1940.

By strain of manpower, money and material resources—and by tremendous demand of those whose voice heretofore had been ignored, our professional military planners — we mounted a *token* force for competition with an adversary who, with less to draw on, had become a menace to the world. A world, in which, belatedly enough, we acknowledged some proprietory-ship, and a precious stake.

Time moved to 1941 and Pearl Harbor.

Our reaction time to that episode was briefer in duration, capsuled, as it was, by the destruction of much of our might, caught napping and totally unprepared on an island in the Pacific.

I recall Guadalcanal and the utter unpreparedness of our initial forces for jungle warfare — an oversight subsequently adjusted when specialized jungle training was given to all units in the Pacific.

I recall the toll of our apathy and unpreparedness in New Georgia, and the tragedy of one of our divisions that had to be evacuated for, quote, *battle fatigue*, unquote.

And, I can also recall the criticism that flowed so freely to the jungle fastness. Our critics had forgotten that what we, in battle, were prepared to do on short notice, or not do, reflected largely the national will, immediately preceding, or the lack of it.

The doubts, self-recriminations and the self-appraisals of those early days were made no less excruciating by that knowledge.

Nor were our heavy losses made less appalling by recognition of the fact that our men were ill-equipped mentally or morally, let alone physically, for the task to which they had fallen heir.

It was inconceivable . . .

It was inconceivable to me that what was happening in that dense concentration of the invisible and the unknown, was happening to Americans and to the America that was part of me.

Introspection, of necessity, was short-lived.

Those of us who survived the first big offensives, without benefit of preparedness and indoctrination, were speedily self-educated to the law by which we found ourselves surrounded, the jungle law to kill or be killed, and its philosophy of "survival of the fittest."

So, we arrive to the *now* of our time, to current history.

We have emerged from out of our isolationism and comfortable pacifism at considerable cost.

We should have learned that it was our strength, once fully applied, and our unity, when achieved, that were finally decisive in the wars we fought across the world, from 1941 through 1945.

In this day, only briefly removed, in years, from the jungles of 1942, we find the issues at stake no less disturbing than they were in that earlier time and, if anything, a good deal more dangerous and thought provoking.

I doubt it will ever again be said, by anyone, that we are expending ourselves to come to the aid of an England, or some other country.

Should another war ensue, it will be obvious that it is the strength of this country and its way of life that are the primary targets for attack.

It will be from the *start* that we shall be attacked, and it will be from the *start* that we shall have to function.

I am not here today to give a lesson in military preparedness. Nor to bring you up to date on the manner and methods by which the Army prepares.

Rather, I hope, by touching briefly on history, to impress upon you my *own* feelings and thinking about our kindred obligations in these times, and how I would propose that we, as individuals and organized elements of our society

GENERAL William H. Arnold was born in Dyersburg, Tenn., in 1901. He studied at Castle Heights Military Academy in Lebanon, Tenn., from 1917 to 1919, and received his B.S. degree from the United States Military Academy in 1924. He was graduated from the Command and General Staff School, Fort Leavenworth, Kansas, in 1938.

In September, 1941, General Arnold was detailed to the General Staff Corps, and served as G-1 of the IV Corps until March of 1942. From then, until April 1943, he was G-3 of the IV Corps.

General Arnold, next, became Chief of Staff of the XIV Corps, overseas. He took command of the Americal Division in 1944 on Bougainville, seeing service also in the Philippines.

After various post World-War II assignments, including command of the United States forces in Austria (1953-1955), General Arnold became in 1955 the Commanding General of the 5th U. S. Army, with Headquarters in Chicago.

General Arnold's decorations include the Distinguished Service Medal and the Legion of Merit.

might approach these, if, indeed, we are to forestall our own destruction.

The refinements of this century have not eradicated from our world, or cast out from it, the jungle and jungle rule. Only the sides have changed—and the weapons.

. . . dilemma of our time

It is shocking that when we stand at the edge of understanding of our universe and the potent force within it, that could be beneficial to all mankind, we are forced, once more, to step back several centuries in time to insure that predatory man, in his inhumanity to man, and in his material greed and race for power, does not trigger that force, instead, for mankind's own destruction.

This, then, might be said to be the dilemma of our time!

It is a pity that the reach of man for the moralities continues to fall so short of his progress in the fields of science and technology.

Who, we ask, is to assume the burden of the task for establishing a better and more equitable international balance and sense of proportion?

It would be difficult to measure the responsibility and the challenge involved.

But, the answer is obvious.

It has fallen to us, to our nation, to assume the leadership of the free world community.

Whatever may have been the process by which it came about, whether we like it or not, we are, depending upon a personal point of view, either stuck with it, or, grateful for it.

Grateful that it is the Stars and Stripes and not some other less benign standard that frames the beacon of world leadership.

What Clemenceau, the great Premier of France in World War I, once said of war, may now be paraphrased for peace. Peace, like war, is too serious a business to be left to the soldier alone—or, to any one nation, or any one faction of it.

The responsibility is at the threshold of every home, and at the gate of every palace and chancellory existent in the world, and rests finally with every occupant come of age.

This means the individual must think and act and do as he would have his government and his nation think and act and do.

In our free world-leadership role, it falls to us, by action and word, to establish the pattern and set the pace; if we are to convince the rest of the world of our own orderly house, and our capacity, therefore, and stability as a reliable and potent factor for peace.

The world, as was so adroitly noted by Chairman Khrushchev, during his recent visit here, is now largely "from Missouri," and bug-eyed. This does not exclude Mr. Khrushchev and Company.

Mr. Khrushchev, as you have found, is a man who sees a great deal more than he admits, and the proof of that may be apparent in the nature of our future.

He is also a man who states his case very well, even as he rattles his satellites and his moon-shots, for emphasis, not unlike Hitler's death rattling of an earlier day.

If we are not to be cowed by such histrionics, neither would it be wise to ignore the act, for its measure of the man and the significance of the achievement involved. A regime, capable of such scientific development, and in whose custody there is manpower of corresponding caliber, rates a long double take.

While we will not be standing by and waiting, it is a certainty the Soviet will go further, in its electrifying research, which, in one way or another, must necessarily carry considerable weight in the privacy of conference rooms around the world.

The Premier has told us of his plans and, during his visit, repeatedly confided in us that we Americans can expect to *best* him, and the inevitabilities, upon which he is launched, *only* in the allied fields of pigs and sausages.

I am hoping that the opportunity, given some of us, for a long hard look at this complicated man may prove as helpful to us, in our considerations, as Mr. Khrushchev says he found his personal inventory of America "useful" to his.

Had we any doubts before of the astuteness of the man, as a leader, or of his religious zeal for his government and the way of life it represents, we are now relieved of our wishful thinking. We have been assured by him, personally, that he is all the things he says he is and teaches and, in addition, that his hands are as strong as he says they are, and, as willing, to pick up the guardianship of the world, on terms reservedly his own.

It is to be hoped that Mr. Khrushchev was equally impressed by us. We hope the attitude of steadfastness to our *own* principles and our *own* terms, demonstrated by the majority who received him, during his cross-country tour, evidenced for him our unity and good judgment. It is hoped, also, that these, together with the dignity and regard that keynoted his status, at Camp David, as a responsible head of State, will be persuasive factors and constructive influences, during the long pull of negotia-

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tion for settlement of critical cold war issues.

It might be foolhardy, on the basis of history, to anticipate any radical departures from the old rote of Soviet-brand concession. However, there is the fact that Mr. Khrushchev has his problems, as we have ours, and that to attain his goals and make good his promises to his people, and, incidentally, to us—questionable as we might consider pigs and sausages alone to be as a national panacea—he may have to *give* a little to achieve *his* take.

Whatever his accommodations may be, should he choose to conciliate at all, we may be pretty sure they will be based largely on his resultant share of the swag, and that his concessions will be predicated on the Communist theology and ideology of justification, namely, that the end justifies the means.

We should not delude ourselves, in that respect.

The impregnability of our recent visitor brought to mind my own experiences with fellow travelers of the regime.

I have in mind . . .

I have in mind, in particular, an incident while I was in command of U. S. Forces in Austria.

At an infrequent meeting with the Russian commander of troops in Vienna, I asked him how it was the Russians came to accuse the United States of being the aggressor in Korea. I brought out the fact that, if true, it was the first time in history that the aggressor had *initially* been forced to retreat some 200 miles.

I did not, at the time, expect, with my question, to completely explode the enigma that surrounds the Communist variety of man. And, I did not.

The retort, by the commander, terse, bloodless to a fault, and faithful to the maddening creed, was:

"You were the aggressor." Period.

President Eisenhower and the Department of State have no easy task.

Just how is one to deal with the riddle of a people like that?

Perhaps I delude myself, when I feel it is impossible that a people, as historically extrovert as the Russians, are, in toto, in the image of their Communist leadership.

I honestly do not think that is true, at this time.

I feel, however, that it *will* be true, at some future time, and that time will make them so, as triumphs of research, under their current leadership, multiply, and these successes are attributed, by their government, to the effectiveness of Communism as the glory road to the millenium.

It is this concept of conquest—conquest through ideology—at which they are so apt, that is the real enemy, particularly in those countries on the periphery of reason and understanding . . . the "have-not" nations and those in the under-developed areas of the world.

I should qualify my omissions.

There is real danger elsewhere, as well.

My greatest concern naturally, is with the danger at home, and the "something for nothing" philosophy, now gaining popularity on all levels, within our own hemisphere.

Reactionary as that philosophy may be, to the great American Dream, it is worse than that, in the opinion of our competitors, and, in the words of Mr. Khrushchev, "contemptible." The Premier further amplified his sentiments, when he said: "In my country no one gets something for nothing."

His sincerity about that cannot be denied. The respective roles of man and state are reversed in his country and, in Russia and her satellites, man has the role of servant to the state.

The lure of the "will-o'-the-wisp" has made sufficient inroad in our own country, in the last decade, to give points to some of the communist party line allegations. Our contentious competitors have argued since the boom days of Stalin, that quote "the disruptive gyrations" of our business and economic cycles "create potentials of disorder and violence that ultimately result in war," and, that therefore, "the dictated planning of the Soviet State alone can maintain the peace," unquote.

The time has come . . .

The time has come to look about us—at home. What are the issues at home as we argue for peace and goodwill abroad.

In this day of the thermonuclear and atomic strategy, and target practice at the moon—until this week—as a nation we were deadlocked economically, and strapped by so fundamental a domestic issue as labor versus management.

The instruments of negotiation and collective bargaining provided by law were set aside while men took sides in the manner of disputing nations, and glowered darkly at one another across a yawning "no-man's-land."

Prior to Sunday—who could foretell how many tomorrows would pass out of our lives before this and other great problems already created would be surmounted?

In the economic struggle, we price ourselves out of the world's markets, not necessarily because of high wages

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but more through the lack of productivity.

To illustrate, some months ago I visited a plant in Milwaukee that manufactures tractors. The time was two o'clock, some two hours before the eight hour shift was over.

All individuals on the assembly line were sitting down.

Upon asking why, I was told that they had completed their norm.

Had production of tractors been continued for the two hours after the norm had been achieved, I am sure that we could better meet competition anywhere, anytime.

If there is to be a norm then let us make sure that it equals or exceeds that established by our number one competitor who has declared war on us on the world economic front.

I doubt the waste of time and manpower, resulting from such practices, reflects favorably for anyone, employer or employee, or that they are strong evidence of the virility to which we lay claim as a nation or a breed, selected by providence to lead the world out from the jungle wilderness.

Personally, I think this type of situation indicative of a creeping decadence that appears to have set in is a by-product of our prosperity.

What has happened to the old incentives?

If they are no longer self-propelled, it may be necessary to provide them by injection.

The communists, by borrowing from the west the best we have been able to contrive, are thriving on this kind of cure. They are finding pay dirt in recognition and reward for the industrious and ambitious, and through incentive programs of one kind or another, are raising their production levels above the drone norm.

Can it be possible that while our opponent strains against it, we, on the other hand, willingly subscribe to the norm as the ultimate, and to mediocrity as a sound philosophy?

Our competitor is not confining his challenge of the norm and the mediocre to industry alone.

The Soviets are excelling, also, in the field of education.

While we are only now beginning to recognize some of the fallacies in our own educational system, geared to the mental level of an outmoded average, or what was once considered average — Russia a long time ago introduced into her plan a program of student and subject selectivity calculated to produce an "aristocracy of intellect."

How well she is succeeding is apparent in her rich hoard of scientists, technicians and careerists in all the professions.

The Soviet Union is annually graduating twice as many engineers as this country—70,000 of them in 1958, compared to 32,000 in this country. There are more doctors in Russia than in the United States, approximately 164 per 100,000 persons, compared to 130 per 100,000 here.

Particularly critical in our public school system is the plight of the intellectually gifted child, whose development and promise is held back, or retarded, by the requirement, in the majority of our schools, to conform with the average curriculum, still predominant in our country.

It is paradoxical that while this nation is outstanding for the effort extended by it in behalf of the slow or backward child, little planning has been accomplished, or few effective methods introduced, for providing better opportunities for exceptional children. And it is to this category of our youth we may have to look for the solution in this struggle for scientific and technological superiority.

Here is an area in our national life that cries for prompt and judicious consideration, not only by the experts but, more importantly, by full measure of the nation as a whole.

Militarily, I believe we are holding our own with the exception of the state of our readiness to cope with limited aggressions, short of general war.

The Big Stick, our capacity for massive retaliation, thus far has been effective in deterring World War III, which it is our primary purpose to avoid.

Recognition that both sides now have the potential for destroying one another, should nuclear weapons be used without restraint, has had a sobering influence on those who might otherwise be constrained to test their capabilities.

Recognized, instead, as an effective substitute, by potential aggressors, is the limited war, waged in increments and with precise timing, as waged, for example, in Korea, Hungary and in the Taiwan Straits.

It is my opinion that we are exerting undue emphasis on massive retaliation, and woefully unsufficient emphasis on our limited war effectiveness.

There have been 19 "little wars" since 1945, and the situations for extension of that number are not exhausted.

This is indication, for us, of the necessity that exists for better balance militarily as well as economically and morally.

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The premium for this kind of balance runs high. If it is less costly than would be the case in a hot war, there are those among us who fail to reason by that formula.

We stand now at a threshold, not without its counter part in the late 30's and early 40's. But never again, because of man's inventive brain, may we profit by the gift of time as it spared us yesterday.

We must examine ourselves with seeing eyes, and without sentiment, and have the courage to recognize our weakness and acknowledge our follies. We must remedy what must be remedied as vigorously as we criticize those things that we abhor in others.

The American Dream is not life by subsidy and controls, government or otherwise, and it is not predicated wholly on worldly means, which when out of balance to all else, breeds dangerous excesses. Nor is it the hard-sell to a push button existence of flossy ease and leisure. Nor can we tolerate feather bedding on all sides by due process of a paid-up membership in some organized element of our society.

The lesson plans of history prove that civilization survived only as long as people had the will to voice and assert themselves as individuals—to work and sacrifice, and, when necessary, fight to retain it.

The old idealisms, basic in the past to our survival, are as sound today as they were at this country's birth.

It will be the quality of individual thought, as expressed in a free society, and the individual effort made, — whether it be by management, labor, the housewife or the soldier—that will throw the balance for peace and long range prosperity.

In this critical period of our history—when our American heritage hangs in the balance—I am moved to recall the dark prophecy of Lord Macauley who in 1847 wrote in a letter to Mr. Randall, a biographer of Thomas Jefferson, quote "Your Republic will be as dreadfully plundered and laid waste in the Twentieth Century as the Roman Empire was in the Fifth Century, but with this difference: the huns and vandals who ravaged the Roman Empire came from without, while your huns and vandals will have been engendered within your own country by your own institutions" unquote.

ARF in Technical Aid Exchange

An exchange of technical assistance, advice and personnel has been agreed upon by Armour Research Foundation of Illinois Institute of Technology and a leading European research organization.

Announcement of the agreement was made by Dr. Haldon A. Leedy, ARF director, and by Prof. Daniel Dresden, chairman of Toegepast Natuurwetenschappelijk Onderzoek (TNO), The Hague.

TNO, founded in 1932, is jointly financed by the Dutch government and industry. Its staff is similar in size to Armour's 1270 research scientists and supporting personnel.

TNO's scientists bring into this union great experience in applied physics, electronics, chemistry, metals, rubber, ceramics, and mechanics research. They are known internationally for their development of a water purification system now in use throughout the world.

Under terms of the agreement, ARF and TNO will be able to call upon each other for non-proprietary information concerning research data, techniques and equipment.

Personnel may be exchanged for instruction and observation purposes, and specialists at the two organizations will consult with one another on specific projects or research areas.

Leedy and Dresden announced that ARF and TNO may, in the future, propose joint research projects or perhaps subcontract to each other certain portions of a project.

In addition, the two agreed to exchange advice on contacts with industrial firms in the United States and Europe.

Armour, one of the five largest independent research institutions in the U.S., is located in ten modern laboratory buildings on the southern half of the IIT campus.

Its scientists specialize in physics, chemistry, electronics, mechanics, metals, ceramics, fluid dynamics, and engineering economics research, and conduct international research programs in 23 countries throughout the world.

Easy Lifting

A new liquefied silicone rubber has been developed that has made the difficult job of lifting fingerprints from irregular surfaces much easier, declares *Chemical Week*. The rubber, which solidifies in less than five minutes, can reproduce every marking on any surface and can even be used to make castings of impressions in snow or slush.

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New Products

As described by their Manufacturers

Pre-dried Paint

Pre-dried and self-adhesive sheets of pure paint which make it possible to paint without a brush or bucket were announced by Morgan Adhesives Company, Stow, Ohio, a newly formed subsidiary of Bemis Bro. Bag Company, St. Louis, Missouri.

Rather than mix up a mess of resins, pigments, and stabilizers, a layer of pure paint with pressure-sensitive adhesive on its back does the same job as the paintbrush and bucket. There's no odor, no mess, no cleaning up afterwards, and very little work when painting by adhesives. The finished results are professional (and streakless). The item "painted" is ready for immediate use.

The pre-dried paint comes in a sandwich form. The paint is sealed between two layers of paper, one protecting the adhesive and the other covering the paint surface. When applying, the sheet of pre-dried paint is cut to fit the surface area. The backing is stripped off the adhesive side and the paint positioned and put down firmly. Then the surface layer of paper is removed, exposing a dry, bright new painted surface! It's pre-dried ready for a lifetime of hard use.

Tests indicate the fluorescent colors resist fading for upwards of two years, rather than the usual three months outdoor life expectancy of regular fluorescent paints.

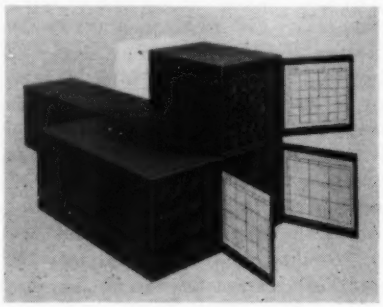
This new pre-dried paint has been tested from painting a wall to covering an airplane wing!

Other uses for pre-dried fluorescent paints with pressure-sensitive adhesives are road marking . . . vehicle marking . . . safety signs . . . signalling devices . . . marking marine equipment . . . industrial warehouse and plant marking . . . pipeline marking . . . helmet marking . . . marking ocean vessels and pleasure craft . . . sports identification markers. In the graphic arts it is used for outdoor posters . . . signs and spectaculars . . . cut-out letters and numerals . . . truck signs . . . store front and industrial signs . . . drum decals . . . advertising emblems.

Samples of this new pre-dried paint are available by writing to Morgan Adhesives Co., Stow, Ohio, centrally located between Cleveland and Akron. This new company manufactures various self-adhesive products for industry and the graphic arts field.

Roll File

The convenient, space-saving Staktube Roll File line for rolled prints, charts, maps and drawings, manufactured by Stacor Equipment Company, Newark, N.J., has been enlarged to 24 sizes. The line now consists of three tube diameters in eight tube lengths.



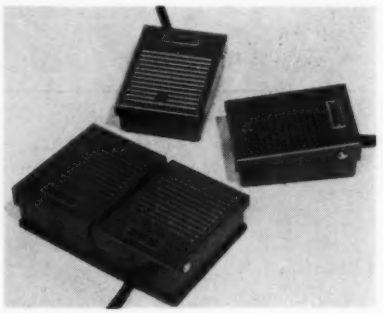
The 15-5/16" square roll files are made of heavy gage steel with a hard-baked gray enamel finish. Tubes are steel-rimmed for long life. Tube sizes now include a new 16-tube, 3⅜" I.D. size, in addition to the 36-tube, 2¼" I.D. and 9-tube, 4⅜" I.D. sizes. Lengths range from 18" to 60".

The convenient, space-saving units can be placed on-end or stacked and interlocked to any height. The hinged doors open fully for easy access and are available with locks.

Catalog sheet and prices on Staktube Roll Files, as well as a complete catalog covering the entire Stacor Lifetime Quality line of drafting room, school and library equipment, available from Stacor Equipment Company, 295 Emmet Street, Newark 5, New Jersey.

Footswitch Models

Reliable "push-on, push-off" operation, high electrical rating and simplified installation wiring are outstanding features of two new Hi-Treadlite maintained-action footswitch models introduced by Linemaster Switch Corporation, Woodstock, Conn.



Model HT-52-D has a single pole, double throw action with a 20 amp. electrical rating at 125, 250 and 460 volts AC. The HT-54-D features a double pole, double throw operation with a 10 amp. rating at 125 volts AC and 5 amps at 250 volts AC. Both models measure 3½" x 2½" x 1¼", have a strong steel housing and a skid-proof sponge rubber base pad. Standard finish is a gray hammertone. Other finishes are available on special order.

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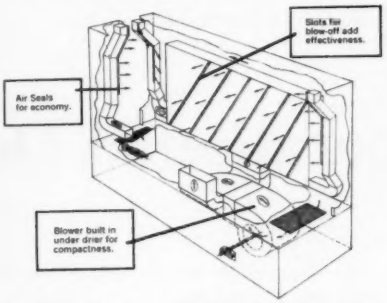
Dual or twin types of both models will also be available, with a maintained action on both sides, and/or one side maintained, the other momentary.

A detailed bulletin and prices on the new Hi-Treadlite line, available from Linemaster Switch Corp., 432 Woodstock Terrace, Woodstock, Connecticut.

Dry-off Ovens

A full range of 24 standardized, monorail, conveyorized dry-off ovens and patch-type drying units have been designed by Ramco Equipment Corporation, New York, to integrate with the company's complete line of power



spray washing, phosphatizing, painting and other types of finishing equipment. Ramco, a division of Randall Manufacturing Company, manufactures vapor degreasers, flowcoat machines, bake ovens, spray booths and electroplating equipment.

The new pre-engineered ovens incorporate the latest design features for eliminating moisture quickly and completely at low operating costs. Both the blower and heating units are located in the bottom of the oven for compactness. High pressure steam and gas-fired heaters, fully protected by safeguard controls (FM), are available in all models. Some Ramco driers being utilized with gas-fired Ramco Power Spray Washing Machines have been fired completely with the exhaust products from the power spray washing machines without an auxiliary burner package being used. Ovens are constructed of interlocking panels, with 2 inches of glass wool insulation between the inner and outer 20-gauge steel panels. Mechanical heat seals confine the heated air in the oven, where it is recirculated at a high velocity by heavy duty centrifugal fans thru slots surrounding the exit and entrance. Free draining parts can be dried in under three minutes.

An illustrated bulletin with complete information available from Ramco Equipment Corp., a division of Randall Manufacturing Co., Inc., 1379 Lafayette Ave., New York 59.

Walk-in Refrigerators

Four sizes of self-contained sectional walk-in refrigerators, with refrigeration units engineered for all types of application—but especially suitable for cooling and storing at low or normal temperatures—are being introduced to the trade by Victor Products Corporation of Hagerstown, Maryland.

Victor Products, a pioneer in refrigeration equipment, has engineered these units so that there is absolutely no guesswork on anyone's part. All models have self-contained refrigeration systems, balanced in capacity for correct cooling temperatures, according to the type of application for which they are to be used.

All models have weather and rust-resistant heavy galvanized steel interiors and exteriors, with satin aluminum finish on exterior. Standard equipment includes interior floor drain for quick wash-down. The walk-ins are vermin proof and sealed against moisture and contamination, with a double seal on all panel joints.

All models are equipped with plug type door, right hand closing, which includes heavy duty galvanized hardware with ball bearing hinges and self-acting roller latch, with inside release handle.

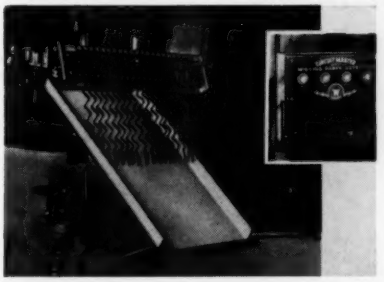
Entire unit warranted for one year with four additional years warranty on the hermetically sealed compressor.

The four models are all now available for immediate delivery. A complete brochure and prices may be obtained by writing Victor Products Corporation, 901 Pope Avenue, Hagerstown, Maryland.

Multiple Feeler Assembly

A new Multiple Feeler Assembly has been introduced by Wintriss, Inc., New York, originators and manufacturers of Circuit-Master control units to stop machines when parts are not ejected on schedule. The new unit protects dies from damage-causing overloads by relaying information to the Circuit-Master Missing Parts Detector control unit.

Properly ejected small parts striking against the multiple feelers of the Type 700-U Assembly break a magnetic contact and send the required impulse to the Missing Parts Detector control unit. If the impulse is not received by the



control unit, patented electronic circuits automatically signal the emergency stop circuit, preventing the machine from striking again. The unejected part cannot cause a die-damaging overload.

Type 700-U was designed for use where parts are too small for the Single Feeler Type 700-L or the wider spaced Multiple Feeler Type 700-0 Assemblies. The new unit can be used on presses with speeds up to 150 SPM.

Circuit-Master Missing Parts Detectors are priced from $271.75 complete; detailed information available from Wintriss, Inc., 20 Vandam Street, New York 13.

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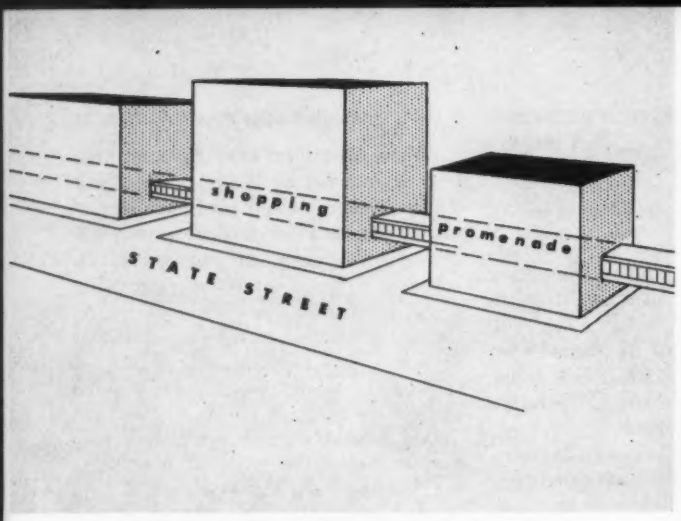


Figure 1. State Street Promenade suggested by Chicago Plan Commission.

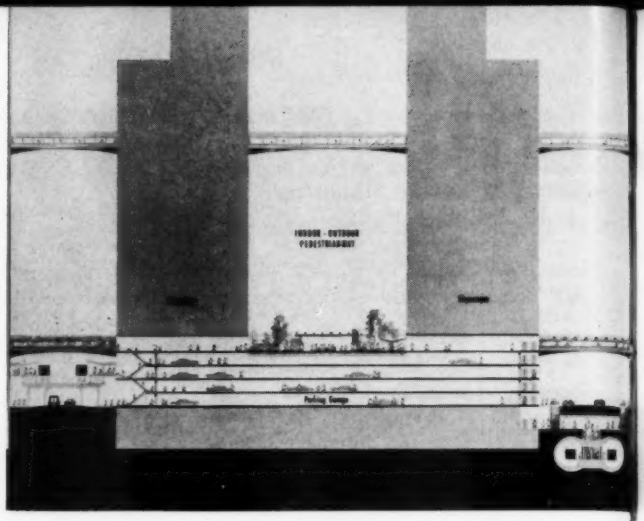


Figure 2. A Pedestrian's Downtown of the Future.

Pedestrian — Vehicular Separation in Down

A Report on a Panel Discussion, held at the General Meeting of the Western Society of Engineers on October 27, 1959.

Moderator: Ira J. Bach, Commissioner, Department of Planning, City of Chicago

Panelists: Frederick T. Aschman, Planning Consultant;
Leslie J. Sorenson, Deputy Commissioner of Streets and Sanitation, City of Chicago;
L. M. Traiser, Staff Engineer, Chicago Transit Authority;
A. L. Tholin, Administrative Engineer of Public Works, City of Chicago.

Agreement as to Need

It was stated by Mr. Bach that there is a growing recognition of the need for some new forms of pedestrian-vehicular separation—that the completion of the radical expressway system will add to downtown vehicular counts, requiring additional parking facilities—that separate pedestrian levels are planned for the civic and governmental centers under the Downtown Redevelopment Plan.

All of the panelists agreed that pedestrian-vehicular separation should receive increased attention by all agencies engaged in planning and development of the downtown area. Varying viewpoints were expressed as to type, location, and extent of new pedestrian facilities to augment or supersede, in part, the existing sidewalks.

Some Basic Concepts

Mr. Aschman presented some basic concepts of what "downtown" is—its function, its traffic needs, and the component elements of a means to meet these needs.

He pointed out that "downtown" is more than a shopping center—is the focal point not only of Chicago and its suburbs, but of a region—is a "headquarters for headquarters," a center for all forms of regional services.

Mr. Aschman stated that the down town area should be highly compact—that this need for compactness should not be overlooked. It should, at the same time, be easily accessible, and should have internal circulation systems which will minimize congestion, in spite of increasing compaction.

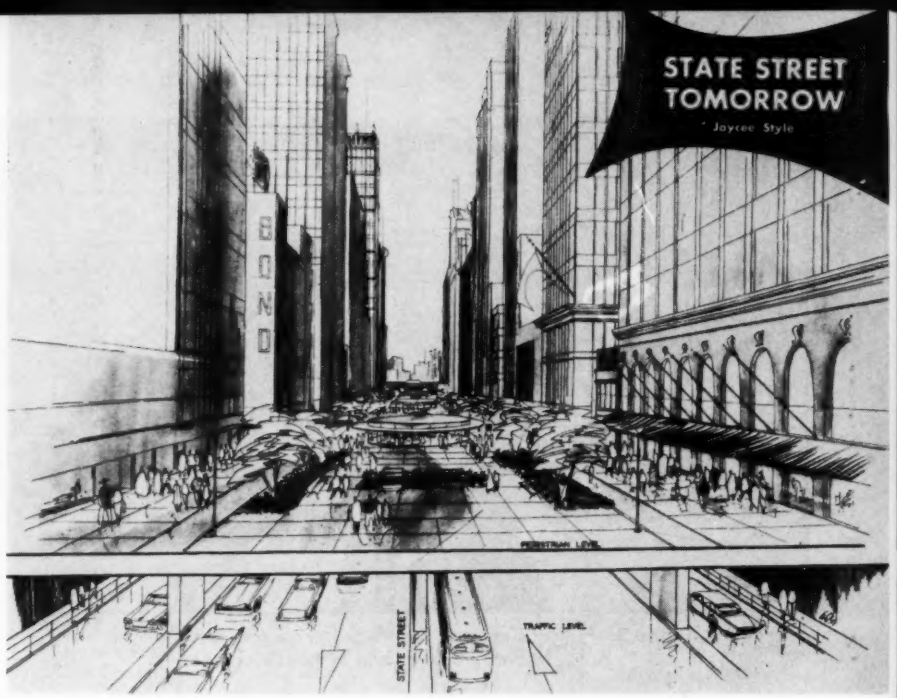
If we are to have compactness without congestion, the improved circulation must be largely in the form of improvements to facilitate pedestrian movements. These new pedestrian facilities must, according to Aschman, provide, at least, the following:

1. Be extensions of and connected with transit facilities.
2. Act as distributors for railroad, bus, and air terminal passengers.
3. Be connecting links between various clusters of activities, such as banking, commercial, theatre districts, etc.
4. Provide for a shopper's promenade in the principal shopping area.

They may, or may not, need to have incorporated within them some means of mechanical locomotion for the pedestrian. The need for and the desirable type of locomotion, depend upon volume of traffic and distances to be traversed, in each instance.

As one example of the type of facility needed for the shopping area, he cited the plan for The State Street Promenade, suggested by the Chicago Plan Commission.

Such a facility, extending from Randolph Street to Monroe Street, would meet the need for an all-weather link between principal stores, and could be linked at once, or later, to a more extensive circulating system. By itself, it would be an adjunct only to the shopping district and be open to the public only during business hours. If linked to a more comprehensive system, it could be converted to a public way and be open at all times. It was assumed to be at an elevation about 20 feet above present street grades.



Down Chicago

Overhead Sidewalks Above Existing Public Walks

Mr. Sorenson pointed out that the problem of pedestrian-vehicular separation is not new—that it has been discussed and solutions suggested for at least 30 years. He mentioned one suggested solution presented by Mr. J. H. Sawyer, and printed in the *Proceedings* of the Western Society in March, 1924. Another plan was presented before the Society by A. L. Tholin in 1951, and published in the *Midwest Engineer* . . . September, 1951. A similar plan, limited to State Street, was suggested by the Junior Association of Commerce, and publicized in the Chicago *Tribune*.

Mr. Sorenson stated that the need for pedestrian-vehicular separation is more urgent now than before. He believed the solution was to be found within existing street limits, rather than by the use of special middle-of-the-block routes such as for the State Street Promenade.

Upper level sidewalks would be very attractive in fair weather, but, in foul weather would probably be abandoned in favor of the vehicular level sidewalks, whose attractiveness would then be augmented by the canopy protection furnished by the upper level. This would negate, in a large measure, their usefulness, as a means of pedestrian-vehicular separation.

Sub-Sidewalk Passageways

Mr. Traiser suggested that additional pedestrian facilities should be primarily —at least for the present—in the form of sub-sidewalk passageways extending outward from the existing mezzanine stations of the subway system to serve nearby frontage. He displayed charts and statistics showing that the heaviest over-all pedestrian movements are now found along these routes. Therefore, the expenditures required would be most efficiently used at these locations. Later, one or more passageways could extend westward to Wacker Drive.

High-level, Middle-of-the-block Pedestrianways

Mr. Tholin presented an artist's conception of a high-level, middle-of-the-block pedestrianway injected into a cross-sectional view of a "pedestrian's downtown" of the future.

It will be seen that the bottom four floors of the skyscrapers are devoted almost exclusively to automobile parking, that the fifth floor (assumed 40 feet above street level) is the level of an established pedestrian plane — that all forms of vehicular movement are below this plane, connected to it by escalators (from street and "El") or automatic elevators (from subway mezzanine). All floors of the parking facility have both escalator and elevator connections to the pedestrian plane above and the vehicular planes below.

Above the pedestrian level, the skyscrapers are set back to allow roof-garden strips on either side of an enclosed promenade, having glass curtain walls and year-'round air conditioning. Centered in the promenade is a pair of continuous moving belts for pedestrian conveyance.

At a much higher level is shown a future pedestrian plane, which might be established in the future.

The enclosed promenades are intersected at one-block intervals by similar routes running in a transverse direction. All of the promenades would cross above existing streets by means of fully enclosed single-span bridges as shown. The 40-foot level above existing streets is sufficient for the pedestrian bridges to clear the existing "El" structure.

The concept shown in Figure 2 was admitted by Tholin to be visionary, but he contended that it is possible of realization in the near future if an initial network of promenades could be financed as tollwalks. Five miles of tollwalk promenades, including passenger conveyors, reaching the major railroad stations, bus stations and 50 per cent of the existing downtown buildings, could be completed, he believed, at a cost of one hundred million dollars or less, including acquisition of 40-foot wide overhead rights-of-way and all necessary building alterations and adjustments en route and two bridges spanning the River, to reach the Union and Northwestern Stations.

The proposed tollwalks would, in general, follow alley routes, but where alleys are non-existent, the necessary overhead right-of-way would be acquired either by lease or purchase. Even along alley routes, some additional right-of-way would be required to obtain a 40-foot width. The estimated cost includes allowance for independent foundations, in most instances, so that when existing buildings are being replaced, the toll-

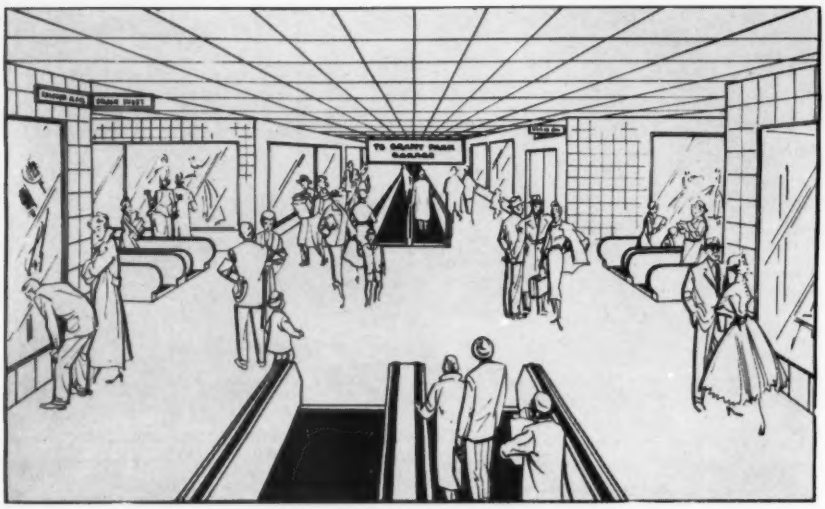


Figure 3. Typical Center-of-the-Block Intersection and Transfer Area; Two-way Speedwalks in four Directions.

walk structure will be secure and intact. An interior view of two intersecting tollwalk promenades is shown in Figure 3.

If 15 per cent of the persons who enter the Downtown area would pay an average of two dimes each during their stay in the area, Tholin said, the one hundred million dollar project would be self-liquidating.

It has been Mr. Tholin's hope, for some years, that some public agency, such as the City of Chicago, or Chicago Transit Authority, or a private agency, such as The Chicago Association of Commerce and Industry, would finance a thorough financial feasibility study of an initial system of tollwalk-promenades.

The completion of the initial system of tollwalk-promenades would establish a pedestrian plane and a new orientation for all subsequent building construction. Without the establishment of a basic plane of reference, the hit-and-miss construction of overhead pedestrian bridges and plazas, now actively contemplated, may become obstacles to more comprehensive pedestrian-vehicular separation in the future.

At the conclusion of the meeting, Commissioner Bach asked for a show of hands by the audience as to whether pedestrian-vehicular separation is necessary. The response seemed almost unanimously in the affirmative.

Large Investment in Batteries

About one third of the Bell System's annual expenditure for power equipment is for storage batteries to back up the usual alternating current power supply, the Winter General Meeting of the American Institute of Electrical Engineers was told in New York on Feb. 1.

"This large investment necessitates exacting requirements for the batteries themselves and well defined procedures to maximize their life and usefulness," R. C. Shair, of Gulton Industries, Inc., said in a paper, "Lead-Acid Storage Batteries in Telephone Service," presented at a symposium on storage batteries.

The most common battery in use today is the lead-acid battery because of its low cost, the availability of raw materials, and the fact that this is the battery about which most manufacturing and performance information is known, he said.

Sublime Idea?

Television advertisers are reported flirting with subliminal messages again —this time aimed at dogs, states *Product Engineering*. The trick would be to transmit supersonic barking, which a dog can hear but a man can't, along with a picture of a dogfood can. The viewer's dog would bark in answer and the viewer, presumably would rush out to buy the food.

PCI Moves to Its Chicago Home

The Prestressed Concrete Institute has established new headquarters, effective on Jan. 1, 1960 in Chicago at 205 West Wacker Drive. This was announced by Randall M. Dubois, newly elected PCI president.

The move from Boca Raton, Fla. was designed to provide greater centralization of activity and dissemination of information to this over $300,000,000 industry, Mr. DuBois explained.

"This move," he stated, "brings us in closer touch with our constantly growing membership now encompassing more than 500 members from all sections of the country. In order to provide more effective member service by the Institute, Chicago was deemed by our directors to be most strategically located for our purposes."

The new headquarters will maintain an up-to-date library for the use of members, engineers, construction experts, architects, trade editors, and students.

The move to Chicago also pointed up, Mr. Dubois said, an expanded public and industry information program by the Institute designed to promote the economic, engineering, and architectural advantages in the use of prestressed concrete for all major new construction.

Mr. Dubois, who is also president of the Freyssinet Company, Inc., N. Y., was elected president of the Prestressed Concrete Institute at the 6th Annual Convention in Miami Beach in November. Other officers and directors elected at that time were: vice president, Jacob O. Whitlock, Mid-West Prestressed Concrete Co., Springfield, Ill. and secretary-treasurer, Charles L. Scott, Jr., Southern Prestressed Concrete Co., Inc., Pensacola, Fla.

The Prestressed Concrete Institute is an incorporated, non-profit association of producers of precast and prestressed concrete products; producers of materials and equipment allied to the prestressed concrete industry; and members of the architectural and engineering profession. The Institute's charter calls for the establishment of industry-wide standards of production, quality-control, and uniformity as well as the advancement of prestressed concrete acceptance through research grants to investigate new applications and engineering concepts.

Reviews of Technical Books

Composite Construction

Composite Construction in Steel and Concrete, by Ivan N. Viest, R. S. Fountain and R. C. Singleton, published by McGraw-Hill Book Company, Inc., New York 36, N. Y. Pages, 147. Price, $7.50.

This manual treats the basic concepts in composite design, composite beams, shear connectors, design of composite beams and shear connectors, and design aids. Among important subjects discussed are: history and advantages of composite construction, elements of a composite beam, methods of constructing composite beams, design assumptions, loading conditions, live load, dead load, shoring, creep, shrinkage, selection of cross section, continuous beams, distribution of movements, slenderness limitations, design load for shear connectors, and effect of height-to-diameter ratio. Several examples are illustrated: simple span bridge with rolled beams; no shoring with rolled beams and cover plates; four-span continuous bridge with welded plate girders, and others.

Ivan N. Viest is bridge research engineer, AASHO Road Test. R. S. Fountain is bridge consulting engineer, Portland Cement Association. R. C. Singleton is vice-president of engineering, Nelson Stud Welding Co.

Water Supply

Water Supply and Sewerage, by Ernest W. Steel, published by McGraw-Hill Book Co., Inc., New York 36, New York. Third edition, 582 pages, 241 illustrations, 58 tables. Price, $9.50.

Water Supply and Sewerage is a compact treatment of the fundamentals of the design and operation of water and sewerage works. It covers not only the fundamental principles and practices in designing and constructing water distribution systems, treatment plants, and sewerage disposal systems but in addition it includes a discussion of important health and economic aspects of the subject. Many new facts, methods, and materials are discussed.

New information is added on the characteristics of pump combinations, on screens, theory of sedimentation, suspended solids, design of wash throughs for filters, surface wash, diatomaceous filters, chlorination, use of chlorine dioxide, and demineralization of zeolites. Also treated are storm water inlets, sewer maintenance, self-purification of streams, conventional and high-rate trickling filters, the activated sludge process, and the design and operation of sludge digesters.

Ernest W. Steel is professor of Sanitary Engineering, University of Texas, and is a member of the American Society of Civil Engineers.

Power Plant Theory

Power Plant Theory and Design, by Philip J. Potter, published by the Ronald Press Company, New York 10, New York. Pages, 710. Price, $10.50.

This book presents the fundamentals of engineering, as applied to power plant design. Principal attention is given to large central power station design. The text may be adapted to college training courses and should be useful to engineers in industry.

Recognition has been given to the advances in the science of power plant design, engineering economy, selection of equipment, and the concept of plant heat rate. The textual presentation emphasizes the economic considerations versus the importance of efficiency. Its scope includes four chapters dealing with diesel plants, gas turbine plants, hydroelectric plants, and nuclear plants. In addition, problems and examples have been taken from practical situations to provide necessary information for problems involving plant layout, magnitude, plant cycle, equipment, and costs.

Included in the 16 chapters is a detailed discussion of fluids, pumps, heat transfer, fuels, generators and auxiliaries, heat exchangers, steam turbines and engines, heat balances, gas turbines, and economics of power plants. Professor Potter has also included a useful appendix containing 20 plates which illustrate physical and thermal characteristics of air, water and mercury, performance curves, and dimensions of pumps, fans, boilers, deaerators, condensers, generators, and engines.

Construction Planning

Construction Planning, Equipment, and Methods, by R. L. Peurifoy, published by McGraw-Hill Book Company, New York 36, N. Y. Pages, 533. Price, $9.00.

This construction guide presents a practical combination of field-tested methods and engineering fundamentals. It illustrates methods for carrying out and planning construction projects from job layout to concrete mixing, from excavating to building cofferdams, from the use of belt-conveyor systems to pile drivers.

Subjects covered include: job planning and management, factors affecting the selection of construction equipment, engineering, fundamentals, tractor and related equipment, excavating equipment, trucks and wagons, rubber tires, belt-conveyor systems, compressed air, drilling and blasting rock, tunneling, foundation, grouting, piles and pile driving equipment, pumping equipment, cofferdams, production of crushed aggregate, forms for concrete structures, concrete, and safety engineering.

R. L. Peurifoy is a consulting engineer and professor of Construction Engineering, A. & M. College of Texas. He is also the author of *Estimating Construction Costs*.

Transaxle Units Pose Problems

Merging automatic transmissions and rear axles into single transaxle units for automobiles poses one of the toughest all-purpose lubrication problems on record, according to four members of the Fuels & Lubricants Department of General Motors Research Laboratories.

Norman A. Hunstad, Robert A. Wilkins, Robert E. Osborne and Ellard D. Davison, Jr., told the Society of Automotive Engineers in Detroit on Jan. 11 that they had evaluated more than 40 fluids in the past few years, trying to satisfy the simultaneous lubrication needs of both hypoid gears in the axle and clutch plates in the transmission.

They reported "some success" but admitted "considerable work remains to be done in matching transaxles and fluids to achieve optimum results," although 34 years have been spent in developing gear lubes and almost 23 years in developing automatic transmission fluids. Simple blends of the two don't produce compatible operation of both transaxle elements.

In the Chevrolet Corvair, which employs a transaxle, separate transmission and gear fluids are used in units equipped with automatic transmissions.

"Plumbed-car" Tests

When transaxle units still were unavailable for road testing, the researchers devised "plumbed-car" tests, using autos with automatic transmissions and rear axles or differentials connected via pipes. These tests provide some idea of what is needed, although fluids working well in plumbed cars may prove unsatisfactory in full-scale transaxle units, the speakers said.

The plumbed-car units, however, did indicate phosphate coating debris from hypoid gears wouldn't cause difficulty in the transmission element, but viscosity fall-off may be greater in a transaxle than in an automatic transmission.

The GM Research group also detailed to SAE members several bench tests they have devised for evaluating various fluids, including 32 mineral oil base and 10 synthetic base fluids.

"In addition," they reported, "numerous additive-base stock combinations have been tried. The results . . . indicated that three mineral oil base fluids and one synthetic base fluid . . . merited further investigation."

Babcock & Wilcox Get Core Contract

The Babcock & Wilcox Company has reported receipt of a contract to supply the third core for the Battelle research reactor at the Battelle Memorial Institute's nuclear center, Columbus, Ohio.

The replacement core will consist of 27 plate-type fuel elements and six control elements. It will be fabricated at the company's Nuclear Facilities Plant, Lynchburg, Va. The fissionable material in each fuel element will consist of highly enriched uranium, alloyed with aluminum in curved plate form.

The Battelle research reactor is used by both industry and government to study the effects of radiation on chemical reactions, semiconductors and transistors, and reactor fuel materials. It is also being used for experiments in reactor and nuclear physics.

Fancy Furniture

Furniture with built-in lighting has been developed jointly by an electric company and a furniture firm, declares *Electrical Wholesaling*. "Panelescent" lamps and fluorescent lamps are featured. The lamp, .025 of an inch thick, produces light over the surface of a panel without the use of bulbs, tubes, filaments or cathodes through the principle of electroluminescence.

WSE Applications

In accordance with Article 1, Section 5 of the By-Laws of the Western Society of Engineers, there is published below a list of applicants for admission received since the last issue of the MIDWEST ENGINEER *magazine.*

Alex Yusis, Jr., Telephone Equipment Engr., Western Electric Co., Inc., 165 N. Canal St.

Howard M. Graff, Gen'l. Mgr. of Raw Materials, Inland Steel Company, 30 W. Monroe St.

Lewis Boyd, Junior Engineer, The Peoples Gas Light & Coke Company, 122 S. Michigan Ave.

H. M. Thompson, Elect'l. Eng.-Asst. Chief, State of Illinois, Division A. & E., 160 N. LaSalle St.

Lewis A. Mahoney, Field Engr. 'B', Northern Illinois Gas Company, 615 Eastern Ave., Bellwood, Ill.

Donald J. Jahns, Manager, Harrison Electric Const. Co., Inc., 747 Milwaukee Ave.

George H. Parrott, Engineer, Northern Illinois Gas Company, 615 Eastern Ave., Bellwood, Ill.

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Ultrasonic Cleaning of Parts

Now they're using sound to clean delicate camera parts.

During manufacture, the heart of a Kodak automatic camera is bathed in hot sudsy water vibrating at a pitch beyond the range of the human ear.

Only an ultrasonic bath will do for the delicate coil assembly of the exposure meter used in the Brownie Starmatic Camera. Other methods might damage hair-fine electrical wire or tiny springs in the mechanism.

Ultrasonic cleaning is also fast—about 30 seconds per coil — and uses plain water with a little detergent as a cleaning agent.

Before assembly in the camera, the coil must be washed to make sure the pivot on which it swings is free of chemicals from a previous soldering operation. The coil assembly converts electricity from the camera's light-sensitive photo-cell to mechanical force that controls the size of the lens opening. It must be completely clean to respond accurately and rapidly to electrical changes.

Ultrasonic cleaners work by "cavitation." In this little-understood phenomenon, "pressure pockets," formed by sound waves traveling at high frequency through the water in the cleaning tank, "implode" against any solid surface in the water, loosening the dirt. A detergent counteracts the acid chemical washed off the coils, and the assemblies are rinsed in another tank.

A typical ultrasonic unit at Kodak consists of a tank filled with solution, usually water, a source of high frequency electricity, and a transducer. The transducer is a ceramic slab, or a laminated combination of metals in a magnetic field, that vibrates when electricity is passed through it. Most Kodak machines use ceramic transducers.

Ultrasonic cleaning has other applications at Kodak where usual chemical and mechanical cleaning methods cannot be used. It cleans the telescopes on Brownie Scopesight Movie Cameras and trays of lenses at Hawk-Eye Works. It is also used in welding and soldering operations. Ultrasonic methods clean metal surfaces so well that no flux is needed in these operations.

Renovation

A method has been developed to refinish old asphalt shingles in place on a roof at a cost of 50 to 60 cents a square foot, *Chemical Week* reports. The shingles are coated with polyurethane plastic compound and sand is sifted over them while the compound is still wet.

Radiation Prepares Fluorine Compounds

A new method for preparing fluorine compounds by radiation has been discovered by Dr. Paul Feng at Armour Research Foundation of Illinois Institute of Technology. Feng is supervisor of the chemical-physics section of Physics Research at ARF.

His method is especially applicable for the preparation of aromatic organic fluorine compounds which are expected to have excellent physical and chemical properties. It also may result in less expensive production of fluorine compounds and lead to the discovery of more materials.

Organic fluorine compounds, in general, are stable, non-flammable and have good temperature characteristics. However, the difficulty in preparing them has prevented their widespread use.

In the new process a mixture of aromatic hydrocarbons and fluorocarbons is exposed to high energy radiation, such as that from a nuclear reactor, accelerator, X-rays, or gamma rays. The fluorine compounds created can be separated from other material by standard laboratory methods, for example, distillation.

Potentially, the process may be valuable in the munitions field and in the improvement of lubricating, hydraulic fluids, and plastic materials. Aromatic fluorine compounds are difficult to synthesize by direct methods because of the involved substitutions that are necessary.

Feng's discovery was a result of a basic research program supported by the Air Force of Scientific Research. It is expected to have both commercial and defense uses, and patent applications have been initiated.

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C-7893 RESEARCH ENGRS. BS to PhD in Chem. Engrg. Position involves carrying out engrg. projects from lab. stage to full commercial development incl. preliminary, intermediate & final cost estimates design & operation of the Pilot Plant Mfgr. of Food Products, salaries range from $6500/12,000 dep. on education & exper. loc. Ill., employer will pay the fee.

C-7895 ASST. ENGR. ELECT. some college Duties: Design, testing, motor application & production work for a mfgr. of small motors sal. $8/10,000 loc. Chgo. employer will pay the fee.

C-7898 RESEARCH ENGR. BSME age 30-45; 5 yrs. exper. in research & devel. engrg., know fluid flow. Duties: Carry out applied research on company's regular & projected products & their components & supv. research lab. for a mfgr. of ejectors, sump pumps, liquid level gages & valves sal. to $9600 loc. So. Ill., employer will negotiate the fee.

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C-7902 PROJECT ENGR. BSME or CE 10 yrs. exper. in engrg. & design of open hearths or Bessemer steel-making plants. Duties: Develop basic engrg. & basic criteria incl. gen'l. arrangement drawings, basic flow diagrams & basic specs. Maintain close liaison with client's representatives. Develop a coordinated schedule of design, procurement & construction which will meet needs of client. Prepare procurement requisitions for items of eqpt. req'g. tech. engrg. review. Review & approve all completed detailed plans & specs. Prepare monthly progress reports. Maint. budget & cost control. Maint. procurement schedule & eqpt. list to assure purchases & deliveries will be made as req'd. to meet approved production schedule. Prepare feasibility reports, preliminary engrg. reports as dir. by chf. project engr. Maint. liaison with client thru duration of project sal. $12/15,000 loc. Chgo. employer will pay the fee.

C-7905 (A) STRUCT. DESIGNER 10 yrs. struct. steel & reinforced concrete exper. for design of struct steel & reinforced concrete on industrial & comm. bldgs. sal. to $9,000 (B) STRUCT-DRAFTSMAN on above. for an arch & engrg. firm loc. Chgo. employer will pay the fee.

C-7907 ASSOCIATE EDITOR BSME or IE age to 40; 3 yrs. exper. in packaging field. Duties: Interview various people in packaging field to find writers for engrg. articles. Interesting work on an expanding publication travel 50%, car req'd. sal. $8/10,000 + expenses, loc. Chgo. employer will pay the fee.

C-7915 (A) CHIEF INDUSTRIAL ENGR. BSME or IE with mech. outlook age 30-45; 8+ yrs. exper. industrial engrg. Duties: Should have mech. aptitude & very analytical mind. Must know plant & mach'y. layout & work simplification plus knowl. of tool & die design, time & work standards. Must be a leader for a mfgr. of elect. eqpt. sal. open loc. Chgo. employer will pay the fee.

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PRODUCT DEVEL. ENGR. BSME, LLB, Bus. Mgmt. 34; Sound background in product devel. & new product promotional activities with admin. ability. 10 yrs. varied exper. with many types of mech. components, interested only in progressive firms. MW: 1054

PROJECT MGR. OR CONSTRUCTION ENGR. BSCE 33; Ill. P.E. license 9 yrs. construction exper. for elect. & gas utility on generating stations & pipe line, incl. supv., liaison, surveying inspection & estimating. 1 yr. field office on hydro-elect. station. Ill. MW: 1052

SOILS ENGR. BSCE —MS Soils Mechanics 29; Military obligation completed, 3½ yrs. as pilot & construction engr. in USAF. 2½ yrs. varied civil engrg. exper. incl. 1 yr. with soils & foundation firm, EIT-Ill. Midwest MW: 1047

APPLICATION ENGR. BSEE 25; 1½ yrs. as an application engr. for mfgr. of transformers. Analyzed customers req'mts. & specifications, from an engrg. & commercial standpoint & prepare proposals. Also 1½ yrs. as a designer of air craft generators. MW: 1035

"Recognition" Called First Task

Recognition of the research scientist and engineer as an individual is the first task of management in the effective utilization of its personnel, according to Dr. Christopher E. Barthel, Jr., assistant director, Armour Research Foundation, of Illinois Institute of Technology.

Barthel, speaking on Dec. 1 in a panel session at the Conference on Efficient Utilization of Engineers and Scientists at the Edgewater Beach Hotel, Chicago, said that today's necessity of integrating the scientist into a team places a heavy responsibility on management to develop its policies to maintain the dignity and productivity of the individual yet establish objectives, plans, and rules of operation which will stimulate the team effort.

The conference, Dec. 1 and 2, was sponsored by Northwestern Technological Institute and the Illinois Society of Professional Engineers under the auspices of the President's Committee on Scientists and Engineers.

Barthel said management must establish certain boundaries and controls, but they should be broad and flexible enough to allow scientists and engineers maximum freedom to develop their work programs. Proper incentives, rewards, and even certain degrees of pressure aid management in developing, strengthening and utilizing the characteristics and talents of the scientist or engineer. "All in all, management's policies must be 'personal' to stimulate maximum productivity of its creative staff."

"Gimmicks" Contributions Limited

Increased use of "gimmicks," job classifications and the like, in Barthel's opinion, make only limited contributions toward improving research performance. He concludes there is "certainly no substitute for judgment, understanding, and personal knowledge of the creative individual."

Tap Selector

A revolutionary, new 28-page easy reference *Tap Selector* has just been issued by The Hanson-Whitney Company of Hartford, Conn., which spells out in detail the correct Tap to use for optimum production, regardless of the material, type of hole, etc. By means of easy-to-use reference charts all necessary information is cross-referenced for easy checking by the engineer, production man or purchasing agent.

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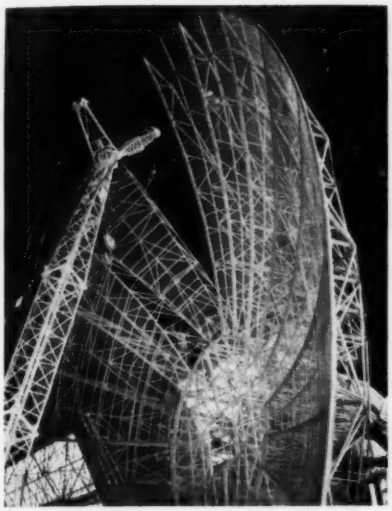
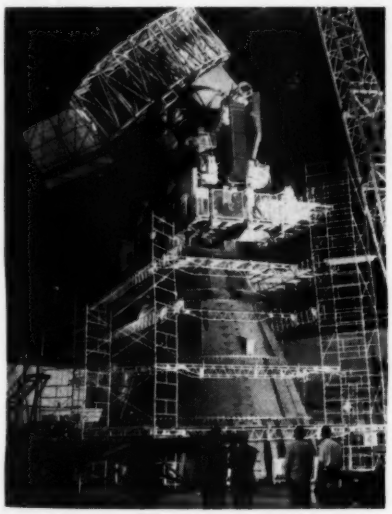


An extremely close tolerance—three-sixteenths of an inch—was maintained by Goodyear Aircraft Corporation in building sections of the BMEWS radar tracking antenna. Fitting of antenna sections to form the concave dish was just as exacting.



A 50-ton crane, complete with 80-foot boom and 20-foot jib, is used to hoist pie-shaped antenna pieces into position during assembly of the tracking antenna atop the supporting pedestal.

The 50-foot high supporting structure already begins to overshadow the men working on it.

Giant Antenna Keeps Watch

First of the giant radar tracking antenna structures for the Air Force's Ballistic Missile Early Warning System (BMEWS) has been completed by Goodyear Aircraft Corporation in Akron, Ohio, and is undergoing tests at Moorestown, N.J., by the Radio Corporation of America.

Giving the appearance of a giant birdbath, the antenna is among the largest ever built. Pedestal and antenna weigh nearly 375,000 pounds, yet despite this great weight, the dish has precision rotating capability and can complete a scan of the skies in a matter of seconds.

Goodyear Aircraft is under contract with the Radio Corporation of America, prime contractor for the detection system, and the Air Force, to produce the BMEWS radar structures as well as huge 140-foot diameter rigid plastic spherical radomes to protect the units.

The units will be used in the detection and early warning of attack from enemy intercontinental ballistic missiles. BMEWS stations will be located at Thule, Greenland; Clear, Alaska, and at a third undisclosed site.

At a BMEWS installation, a hostile missile will be picked up by gigantic radars, while electronic computers determine its path in order to give about a 15-minute warning as to probable location of point of impact.

Prior to delivery to Moorestown, the tracking antenna was assembled and mechanically tested in Goodyear Aircraft's Akron plant. Despite the 84-foot diameter, Goodyear Aircraft was able to do all the work under roof, using the 211-foot high Airdock that is the setting for the construction of nonrigid airships for the Navy's aircraft early warning operations.

The over-all BMEWS program is being managed by the Air Force Ballistic Missile Early Warning System Project Office in New York City, under the direction of the Air Materiel and Air Research and Development Commands.

Nominating Committee Reports

The report of the Nominating Committee for officers and trustees of the Society, and members of the Washington Award Commission to be known as the Regular Ticket, was received by the Board of Direction, February 25, 1960.

The nominations reported by the Committee were as follows:

Officers and Trustees:

President, R. D. Maxson.

First Vice President, P. L. Coleman.

Second Vice President, F. M. Scott.

Treasurer, E. R. Hendrickson.

Trustees (for three years), vote for four:

J. P. Gnaedinger
H. R. Heckendorn
M. V. Maxwell
G. W. Trout

Members of Washington Award Commission (for a three year term), vote for two:

A Past President, A. P. Boysen.

A member, neither a Past President nor a member of the Board nor a candidate therefor, H. W. Johnson.

Corporate Members of the Society are hereby notified of the above nominations for the Regular Ticket.

The Constitution (Article X, Section 5) provides that: "Additional nominations for any office provided for in Sec. 4 of this Article may be made by petition signed by at least twenty Corporate members. Such petition shall be accompanied by the acceptance of the nomination by each nominee in writing and shall be filed with the Secretary of the Society before the twentieth day of March. Any petition so filed shall be presented to the Board of Direction at its regular March meeting. If the Board shall find any person so nominated ineligible for the office for which he is nominated, the petition as it relates to such nominee shall be rejected. Nominations made in accordance with this section shall be known as a Ticket by Petition."

Analog Computer, Effective Aid

The analog computer is "one of the most effective classroom and laboratory demonstration aids possible," two Monsanto engineers said in San Francisco on Dec. 9.

Praise for the computer as a teaching tool was given by Theodore J. Williams and Verlin A. Lauher, Monsanto Chemical Company, St. Louis, in a paper presented during the 52nd Annual Meeting of the American Institute of Chemical Engineers in the Sheraton-Palace Hotel. Their paper, "Available Analog Computers and Their Use as Teaching Aids in Engineering," was given during a session on the automatic computer as a teaching tool.

"The analog computer has shown itself to be an excellent teaching aid in presenting the dynamic behavior of physical and chemical systems" they observed.

"The analog computer, especially if it is of the electronic differential analyzer type, can be readily wired to simulate the behavior of a wide variety of physical systems," they said. "That is, it becomes an electronic model of each of the other physical systems in turn and duplicates through the variations of its internal voltages the changes in the dependent variables of the process being simulated. It thus becomes one of the most effective classroom and laboratory demonstration aids possible, since it is not then necessary for the instructor to build physical representations of each of the examples to be covered. Also, since the action of every dependent variable of the process can be recorded, an analog computer demonstration is often much more vivid than the observation of the actual process itself, particularly if a chemical reaction or other such nonvisible phenomenon is being simulated.

Minneapolis Industry Center Announced

Plans for a multi-million-dollar scientific industry center in suburban Minneapolis have been announced by International Properties, Inc., Twin Cities real estate and development firm.

Options have been secured on property in a tract which will comprise nearly 200 acres, Gordon C. Paske, vice president and general manager of the real estate firm, said. The location is considered ideal for a major scientific industry site, he said. All utilities—gas, water and sewer — will be available shortly and transportation by major highway and rail adjoins the property.

The ultra-modern scientific industry development will house electronic manufacturers and firms with related technological interests. It will be patterned after the internationally-known Stanford Industrial Park, developed by Stanford University in Palo Alto, Calif. Like the California park, it will be typified by buildings of contemporary design, set in well-landscaped, park-like surroundings. Stanford officials have been approached to serve as consultants in the advanced stages of the International Properties project, Paske said.

International Properties was incorporated last September with initial capital of $243,000.

Popularity

Small neighborhood supermarkets are gaining in popularity, reports *Food Engineering*. Consumers like the convenience of getting out of them quickly as well as getting to them easily.

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Calendar of Chicago Engineering

March 16, Wed., WSE Noon Luncheon, 12:00 noon, WSE Hq.

March 17, Thurs., WSE Speaker and Paper Group, 12:00 noon, WSE Hq.

March 22, Tues., WSE General Meeting. Social Hour, 5:15-6:15; Dinner, 6:30; Technical Sessions, 8:00 p.m. WSE Hq. Watch for flyer on meeting.

March 23, Wed., ASME Luncheon, 12:00 noon, WSE Hq.

March 29-31, Tues.-Thur., American Power Conference, Hotel Sherman.

March 30, Wed., WSE Noon Luncheon 12:00 noon, WSE Hq.

April 6, Wed., WSE Noon Luncheon, 12:00 noon, WSE Hq.

April 6, Wed., AIME National Open Hearth Steel Conference and Blast Furnace, Coke Oven and Raw Material Conference, Palmer House.

April 13, Wed., WSE Noon Luncheon, 12:00 noon, WSE Hq.

CTA Gets Experimental Cars

Delivery of the first of four high-speed, light-weight, experimental rapid transit cars, with specially-designed motors, controls, trucks, gear drives, axles, bearing installations and auxiliary braking, was made on February 23 to CTA's Skokie Shops, 3701 W. Oakton street, according to W. J. McCarter, CTA general manager.

The new cars represent another forward step in CTA's continuing efforts to provide the best in passenger-carrying equipment consistent with riding comfort and operating safety.

The cars, manufactured by the St. Louis Car Company, are designed to operate at higher speeds than presently available to the mass transit industry. They are equipped with 100 horsepower motors and controls and will maintain an acceleration rate of three miles per hour per second, reaching a speed of 30 miles per hour in 10 seconds. At this point the cars continue to accelerate at lower rates on the motor curves until a maximum speed of about 75 miles per hour is reached.

The new cars are equipped with the latest type interior lighting system. There is a light fixture over each seat and over each side entrance doorway. Each fixture is of the beam controlled type.

Each car has an electric heating and forced-air ventilating system. Twelve heater cases are provided on each side of the car, with each case containing two double-end, enclosed strip heaters which can be set at three different thermostatically-controlled heating ranges to maintain a comfortable temperature in the cars at all times.

A reversible forced air system is built into the cars which can either force fresh air into the car, or by reversing the fan, for summer operation can draw warm air out of the car and exhaust it to the outside.

The cars have distinctive and attractive exterior and interior color schemes for easy identification by CTA riders. The exterior design combines four colors. The roof, belt rail, and side design background is Tangarine red. From the roof to the belt line the color is Silver-gray. The lower part of the car, from the belt rail to the bottom of the side sheets, is in Luxury maroon with striping in Ebon black.

Bright and Cheerful

Light colors give the interior of the cars a bright and cheerful appearance. The ceiling, down to the advertising racks, is painted in Flamingo white. Bisque gray is used from the bottom of the advertising racks to the wainscot and also on the full length of side and end door panels. Sunset grey is the color used on the wainscot, extending from the bottom of the windows to the floor.

The cars were designed and built under a cooperative research program sponsored by the CTA and the following participating companies: American Steel Foundries, The Budd Company, Dana Corporation, General Electric Company, General Steel Castings Corporation, Hyatt Bearing Company, LFM Manufacturing Company, S.K.F. Industries, St. Louis Car Company, Timken Roller Bearing Company, Transit Research Corporation, Westinghouse Air Brake Company, and Westinghouse Electric Corporation.

All of these organizations have made substantial financial contributions and supplied engineering services in connection with this program. Some components are provided on a reduced cost basis; other components are on a long-term test basis with the option to purchase, and some components are provided without cost to CTA.

Shear Strength

How can the shear strength of a driven aluminum rivet be determined? What is the best hole size for a hot-driven aluminum alloy rivet?

These and many other aspects of riveting aluminum parts are explained in a new technical booklet, "Riveting Aluminum," just published by Reynolds Metals Company.

The 52-page book covers use of conventional and special rivets and explains design and fabrication of riveted joints. Tables in the book list weights and dimensions of aluminum rivets, recommended rivet lengths, mechanical properties of wrought aluminum alloys, and other data.

The booklet is available on letterhead request from Reynolds Metals Company, Dept. PRD-23, Richmond 18, Virginia.

Street of Gold

Although many Europeans erroneously believed that the streets of America were paved with gold, there actually was one saturated with the metal, reveals *American Machinist*. Located in San Francisco in 1848, it contained so many specks of gold that some people picked it out as a means of making a living. How the gold got there is a mystery, but some say miners who lodged at the United States hotel lost tiny grains enroute from the leaky canvas bags they carried.

In Memoriam

The Western Society of Engineers has been notified recently of the deaths of the following members:

Horace L. Howell ('20, LM), died on December 18, 1959.

Peter Ziroli ('51, M), died on February 2, 1960.

Roy W. Emmert ('19, LM), died on February 27, 1960.

News of Western Engineers

or: Personals of Personable People

Western Society Member, **Clyde N. Baker, Jr.,** has been elected vice-president of Soil Testing Services, Inc., consulting soil and foundation engineers with principal office at 1827 North Harlem Avenue, Chicago 35, Ill. David E. York has been elected treasurer of the Corporation.

•

Soiltest, Inc., Chicago, has announced the organization of a subsidiary, Soiltest International S.A. of Lausanne, Switzerland.

Theodore W. Van Zelst, WSE member and Soiltest president, said that the Swiss corporation will direct sales and distribution for the company's European, African, and Middle Eastern markets.

Soiltest, which manufactures engineering test apparatus for soils, concrete, asphalt, and similar construction materials, also has a technical sales office in Brussels, Belgium and a warehouse in Breda, The Netherlands.

Founded only 13 years ago, Soiltest has sales representatives in 90 nations. Its products are used in the design of construction and in quality control of construction materials on civil engineering projects such as dams, airfields, roads, power plants, and factories. Testing equipment manufactured by Soiltest is being used in 110 different countries.

•

Paul Rogers & Associates, Inc., Consulting Engineers, 5 North Wabash Ave., Chicago 2, Ill., have announced that Mr. Eli Werner Cohen has been admitted as an Associate in the organization. This is in line with company policy that staff engineers become Associates upon successfully passing the State Structural Engineering Registration Examination.

Mr. Cohen was also appointed assistant chief engineer, with added responsibility of projects.

•

A. Richard Ross has been named sales engineer in the Midwest for the Industrial Components Department of Corning Glass Works. The department handles sale of glass components to equipment manufacturers.

Ross will work out of the company's Chicago office in the Merchandise Mart.

He joined Corning in July, 1955, as a junior engineer and subsequently served as a product engineer before being named to the sales staff in December, 1958.

Ross received his bachelor of science degree in chemical engineering from Northwestern University.

•

De Leuw, Cather & Company, consulting engineering firm with offices in Chicago, Boston, San Francisco, and other principal cities, announces the re-election of the following as officers of the firm: Western Society member **C. E. De Leuw,** president; WSE member **L. H. Cather,** vice-president; and WSE member **V. E. Staff,** chief engineer. In addition, **R. H. Anderson, J. E. Linden, W. R. McConochie,** all WSE members, and R. B. Richards, were elected directors at a recent meeting of stockholders.

•

The Portland Cement Association has announced the merger of its Highway and Municipal and Soil-Cement Bureaus into a single Paving Bureau at its General Office in Chicago, effective January 1.

Gordon K. Ray, former manager of the Highways and Municipal Bureau has been named Manager of the new Paving Bureau, which will be responsible for providing engineering service and developing technical and promotional information on both concrete and soil-cement pavement.

G. Donald Kennedy, president of the Association, said that integration of the personnel and facilities of the two bureaus will result in greater coordination and concentration of effort and provide even better service to design and construction personnel, and others in the paving field.

•

Elwood Burgess, Jr., United States Gypsum Company, has been appointed production engineer at Chicago. The announcement was made by H. F. Swaney, production manager of the Southwest Division.

A graduate of the University of Pittsburgh, Burgess joined United States Gypsum in 1954 as production assistant at the Sweetwater, Tex., Plant. In 1955 he became board plant superintendent and was appointed mill superintendent in 1958. In 1959 he was transferred to Fort Dodge, Ia., as board superintendent.

Burgess lives with his wife, Sue, and

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Opening of new rights-of-way, and trimming of trees and chemical brush control on existing rights-of-way are operations which should be entrusted only to specialists.

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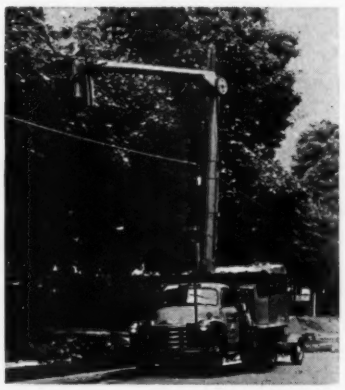
Attention, Mr. Earl Reynolds



daughter, Sharman, at 4937 Florence in Downers Grove, Illinois. He belongs to Alpha Kappa Psi Professional Fraternity, Kiwanis Club, Junior Chamber of Commerce, and is a past member of the Lions Club.

•

Appointment of Western Society member **Titus G. LeClair** as manager, nuclear power applications for General Dynamics Corporation's General Atomic Division was announced by Dr. Frederic de Hoffmann, senior vice-president of the Corporation and president of General Atomic.

T. G. LeClair

LeClair was scheduled to go to General Atomic about March 1 from Chicago where he was manager of research and development for Commonwealth Edison Company.

Long associated with the U.S. utility industry in executive engineering positions, LeClair is a recognized leader in the development of nuclear power for central station generation of electricity. He has been an official of the Nuclear Power Group, Inc., which co-sponsored Commonwealth Edison's recently completed Dresden nuclear power plant at Joliet, Ill. He also has served in advisory capacities to the Atomic Energy Commission and Joint Congressional Committee on Atomic Energy.

C. A. Rolander, Jr., vice-president of General Atomic Division, with whom LeClair will be associated, said LeClair will play an important role in the expanding development of commercial applications for General Dynamics' advanced power reactor systems. The systems include the High Temperature, Gas-cooled Reactor (HTGR) which is designed to provide a short-cut to the nation's goal of economic nuclear power. A prototype HTGR plant of 40,000 kilowatts size will be completed in 1963 on the system of the Philadelphia Electric Company, with support from 52 other leading utility companies in 31 states. The 53 companies, organized as High Temperature Reactor Development Associates, Inc., comprise the largest and most widely representative group of U.S. utility companies to support a single atomic power project.

Rolander said:

"Mr. LeClair is widely known among leaders of the nation's utility industry where he has an outstanding record of achievement, particularly in the field of nuclear power. We are delighted that he is to be associated with General Dynamics' power reactor program and the Corporation's developing broad position in the power industry."

LeClair is a native of Wisconsin and an engineering graduate of the University of Idaho from which he received an honorary doctorate of science in 1951. He has been associated with Commonwealth Edison Company since 1923.

For the past four years he has served as a member of the Illinois Atomic Energy Legislative Commission, to which he was appointed by Gov. William L. Stratton.

In addition to his work on task forces and committees of the AEC and the Joint Congressional Committee, he recently served as chairman of a committee established by the Atomic Industrial Forum to develop procedures for use by the Government and the electric generating industry in evaluating nuclear power reactors.

Because of his national prominence in the engineering field, he has served as president of several professional societies, including the Engineers Joint Council, the Illinois Engineering Council, American Institute of Electrical Engineers, as well as the Western Society of Engineers. He also has been president of the American Nuclear Society and is a member of the National Society of Professional Engineers.

•

Western Society member **John P. Gnaedinger,** president of Soil Testing Services, Chicago, addressed the Region I, Bureau of Public Roads, Conference on Soils and Foundations, in Boston, on February 2.

The subject of Mr. Gnaedinger's talk was "The Utilization of Consulting Soil and Foundation Engineers in the Federal Highway Program."

•

Western Society member **E. T. Blix** has retired as president of Mississippi Valley Structural Steel Co. Mr. Blix, however, will continue to serve the Chicago firm, as a member of the Board and as a member of the Finance Committee.

G. W. Schlutius has been elected as president of Mississippi Valley Structural Steel Co., and J. C. Arntzen has been named as executive vice president in charge of sales.

•

Combustion Engineering, Inc. has announced the appointment of Mr. Francis A. Schroff as manager of corporate purchasing. Formerly purchasing agent for the New York Division of Combustion, Mr. Schroff now assumes responsibility for purchasing at the Company's plants at Chattanooga, East Chicago, Ind., St. Louis, Monongahela, and Chicago as well as the New York Division. A Law Graduate of National University and a member of the Purchasing Agents Association of New York, and the National Association of Purchasing Agents, Mr. Schroff came to Combustion Engineering in 1953 after prior service with the National Production Authority.

•

Western Society member **Joseph F. Koenen,** formerly a project engineer with De Leuw, Cather & Company, consulting engineers, Chicago, announces

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the establishment of his office as a consulting civil engineer. Mr. Koenen specializes in water supply, sewerage, and drainage projects, offering appraisals, feasibility studies, design, and supervision. Offices are located at 529 S. Prindle Ave., Arlington Heights, Ill. In addition to De Leuw, Cather & Co., he has been employed by the Metropolitan Sewerage Commission of Milwaukee, Ammann & Whitney, consulting engineers, and Soil Testing Services, Inc. Mr. Koenen is presently consulting engineer to the Lake County Public Water District, Lake County, Ill., a 420 square mile water supply and sewerage authority.

•

Ivan C. Sengenberger has been appointed assistant to the manager of operations for the Chicago district of U. S. Steel's American Steel & Wire Division, it has been announced by James E. Brown, Chicago district manager of operations.

A native of Joliet, Ill., where his father was employed with American Steel & Wire, he joined the Division in 1926 as a workman in the billet yard at Waukegan Works. He held various plant jobs there during the next three years, until he left the company in 1929. He returned to Waukegan Works four years later as an employee in the shipping department.

In late 1933, he returned to Waukegan Works four years later as an employee in the shipping department.

Three years later he became supervisor of fence erection for the Waukegan area. He became industrial relations supervisor in 1942, and in 1946 was named to serve in the dual role of supervisor of industrial relations and supervisor of all fence erection for Cyclone.

He was promoted to general superintendent of production in 1949, and advanced to manager of operations in 1957.

During his many years in Waukegan, Mr. Sengenberger has been active in civic affairs. He is known for his work with the Boy Scouts and is presently serving on the board of directors of Waukegan Junior Achievement.

•

C. C. Martin has been named a director of S&C Electric Company, according to WSE member **John Conrad,** S&C president. Mr. Martin is S&C vice president of manufacturing.

Mr. Martin left Douglas Aircraft Company in 1948 to become assistant production manager at S&C, leading independent manufacturer of high-voltage switchgear. He was named vice-president in 1954.

Mr. Martin is a graduate of the University of North Carolina (1937), and is a member of the American Management Association.

He lives at 1991 York Lane, Highland Park, Illinois.

•

The appointment of William M. Cotter, 535 Andy Drive, Melrose Park, Illinois, to the position of manager, reinforcing bar department for U. S. Steel Supply Division's Newark district was announced in Newark by W. R. Holmes, district manager.

A native of Chicago, Mr. Cotter received his public education there and was graduated from the Illinois Institute of Technology in 1949 with a B.S. degree in civil engineering. He joined U. S. Steel that year as a draftsman in the Supply Division's Chicago district office. Subsequently, he was named estimator—reinforcing bars and, in 1952, was appointed sales engineer for the Chicago district, the position he held at the time of his present promotion.

A U. S. Navy veteran of World War II, Mr. Cotter is a member of the American Society of Civil Engineers and a former member of the Western Society of Engineers. He and his wife and their two children plan to make their new home in the Newark area.

•

The resignation of Carl L. Hecker as president and director of The Oliver Corporation, farm and industrial equipment manufacturer, was announced by Alva W. Phelps, chairman of the board and chief executive officer.

"Mr. Hecker will continue to serve the company as a consultant," Mr. Phelps said following a meeting of the Board of Directors in Chicago.

Mr. Phelps was elected president to serve until a successor to Mr. Hecker has been selected.

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MIDWEST ENGINEER

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Noon Luncheon News

Series II Continues

Mr. **James J. Brown,** MWSE, was recently elected chairman of the Executive Advisory Committee of the Morse Twist Drill and Machine Company of New Bedford, Massachusetts. Mr. Brown is Midwest district manager for the Morse Company, with offices located in Chicago.

•

Combustion Engineering, Inc., one of the nation's largest manufacturers of steam generating equipment, has announced the election of Herbert M. Lowenstein and John L. Menson as vice-presidents.

Mr. Lowenstein, formerly director of engineering product design, has been named vice president and chief engineer. He joined Combustion in 1924 after prior service as an engineer officer with the Navy and as field engineer for the Bureau of Yards and Docks. He has served the Company in various engineering capacties including boiler designer, contract engineer and assistant chief engineer in addition to his more recent duties. During World War II he was on leave of absence with the Army Corps of Engineers as division engineer on the Manhattan District A-Bomb Project at Oak Ridge.

Mr. Lowenstein is a graduate of New York University School of Engineering with a BS degree in Mechanical Engineering and has an LLB degree from Rutgers University. He is a member of ASME, Verein Deutscher Ingenieure and serves on the Advisory Committee of the N. Y. U. School of Engineering.

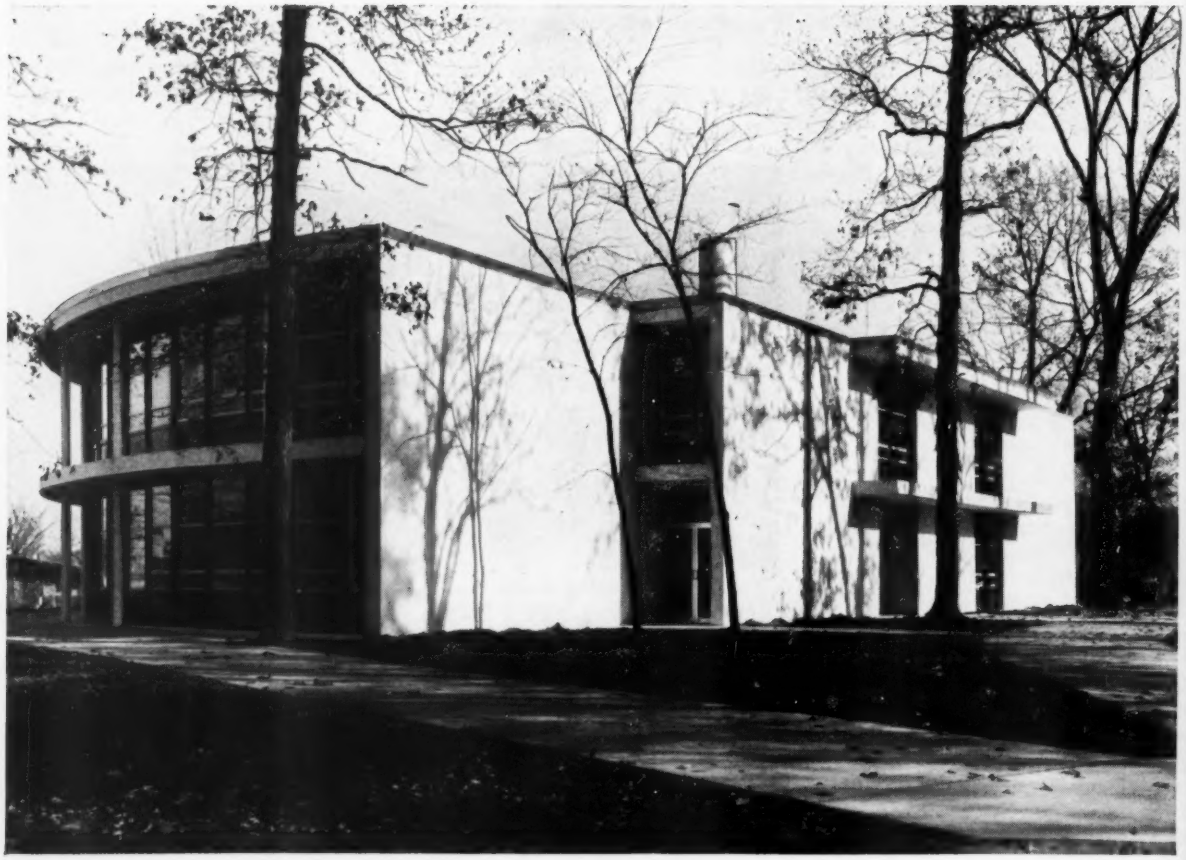
Mr. Menson, formerly director of engineering field operations, has been named vice president-engineering. A member of the Combustion organization since 1936, Mr. Menson held the positions of manager of industrial engineering, East Chicago Div., and assistant chief engineer prior to being placed in charge of field operations. He is an engineering graduate of the University of Michigan and a member of ASME, ASA, ASTM and the American Welding Society. Long active on the standards and codes committees of these societies, Mr. Menson has served as chairman of the American delegations to several meetings of the International Standards Organization, both here and abroad.

He is well known in engineering circles as the author of numerous technical papers presented before the various engineering societies.

On February 3, the Honorable Emmett Morrissey, center, Judge of the Municipal Court of Chicago, spoke on "The Narcotics Menace." This was a fascinating and rather convincing dissertation. Noon Luncheon Chairman John P. Donovan is seen at the left; Howard A. Carter is at the right.

John B. Verlenden, left, Engineer with Abbott Laboratories, spoke at the Noon Luncheon Meeting of the Western Society of Engineers on February 10. His subject was "The Four Castles," and was concerned with the lore and history of fire fighting. Mr. Verlenden was introduced by Safety Engineer Richard Larsen, right.

Those attending the Luncheon Meeting on February 17 heard Gaylord Donnelley, President of R. R. Donnelley & Sons, talk on "Engineers in the Field of Printing." Mr. Donnelley discussed the contributions that engineers have made in this important industry, and invited them to make use of the opportunities open to them.



12-room concrete school in 3 months with unique "lift-slab" method!

Classrooms coming up! *Observing one of the 23 jacks used to lift the roof slab are Gregory Lauer, builder; James McCarron, architect; Dorsey Moss, engineer.*

St. Therese Catholic School, Fort Wayne, Indiana, shows how concrete and new techniques meet the need for accelerated school construction.

Bids were received June 23rd. Construction was under way by July 17th. The ground floor slab was cast in place first. On top of this was cast the second floor slab—and on top of this the roof slab. Lifting of the slabs into position started August 25th.

Hydraulic jacks attached to columns were used to hoist the roof and second floor slabs. Each slab weighed approximately 370 tons and was 150 feet long and 88 feet wide. Lifting rate was two feet an hour. Total school area is 21,560 square feet—12 classrooms, six on each floor.

School opened October 1st. But time was not the only saving. Concrete "lift-slab" technique also meant lower construction costs. Long life and low upkeep will assure minimum annual cost. If your community is considering a new school, write for complete information.

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A national organization to improve and extend the uses of concrete

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